

Appl. No. 10/084,489
Amdt. dated February 1, 2005
Amendment under 37 CFR 1.116 Expedited Procedure
Examining Group 2661

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Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1 1. (Presently amended) A device for filtering at least a predetermined
2 selected optical signal having a predetermined wavelength range from a series of optical signals,
3 the device comprising:
4 a polarization alignment means for substantially aligning substantially orthogonal
5 polarization states of an optical input signal so as to produce a polarization aligned optical signal;
6 a polarization manipulation means for imparting a controlled polarization
7 manipulation to said polarization aligned optical signal so as to output a polarization manipulated
8 optical signal having one of at least two distinguishable polarization states including a first
9 polarization state and a second polarization state;
10 an optical separation means tunable liquid crystal etalon filter having a tunable
11 separation wavelength for spatially separating the selected optical signal from said series of
12 optical signals when the polarization state of the polarization manipulated optical signal is in a
13 first polarization state, thereby forming a first and second output optical signal, and maintaining
14 the spatial alignment of said selected optical signal with said series of optical signals when the
15 polarization manipulated optical signal is in a second polarization state so as to form a third
16 optical output.

Claims 2 - 3 (Canceled).

1 4. (Presently amended) A device as claimed in claim 1 ~~3~~ wherein said etalon
2 filter transmits the selected optical signal when the polarization state of the second optical signal
3 is in said first polarization state and reflects the selected optical signal when the polarization state
4 of the second optical signal is in the second distinguishable state.

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Claims 5 - 9 (Canceled).

1 10. (Original) A device for filtering at least a predetermined selected optical
2 signal having a predetermined wavelength range from a series of optical signals, the device
3 comprising:
4 first and second input/output optical waveguides;
5 a first birefringent crystal adjacent said first and second optical waveguides for
6 spatial separation of orthogonal polarizations;
7 a first polarization rotation element adjacent said birefringent crystal for rotating
8 one of the orthogonal polarizations so as to produce an aligned polarization output;
9 first variable polarization manipulation means adjacent said first polarization
10 rotation element for manipulating said aligned polarization output in a controlled manner so as to
11 produce a rotated polarization output; and
12 a tunable Fabry Perot etalon liquid crystal filter adjacent said first variable
13 polarization manipulation means for filtering a tunable wavelength from said rotated polarization
14 output and reflecting other wavelengths back through said first variable polarization
15 manipulation means, said first polarization rotation elements, said first birefringent crystal
16 element to said second optical waveguide.

1 11. (Original) A device as claimed in claim 10 wherein said device further
2 includes a focusing means for focusing the light emitted from said waveguides.

Claims 12 - 15 (Canceled).

1 16. (Presently amended) A device for filtering a series of predetermined
2 selected optical signals having predetermined wavelength ranges from a series of optical signals,
3 the device comprising:
4 a polarization alignment means for substantially aligning substantially orthogonal
5 polarization states of an optical input signal so as to produce a polarization aligned optical signal;

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6 a first polarization manipulation means for independently imparting a first
7 controlled polarization manipulation to said polarization aligned optical signal so as to output a
8 first polarization manipulated optical signal having one of at least two distinguishable
9 polarization states including a first polarization state and a second polarization state;

10 a first optical separation means for spatially separating a first selected optical
11 signal from said series of optical signals when the polarization state of the polarization
12 manipulated optical manipulated signal is in a first polarization state, thereby forming a first and
13 second output optical signal, and maintaining the spatial alignment of said first selected optical
14 signal with said series of optical signals when the polarization manipulated optical signal is in a
15 second polarization state so as to form a third optical output;

16 a first reflection element, reflecting said first and third optical signal after they
17 have passed through said first polarization manipulation means; said reflection element reflecting
18 the first and third optical signals towards a second polarization manipulation means;

19 a second polarization manipulation means for independently imparting a second
20 controlled polarization manipulation to said first and third optical signals so as to output a second
21 polarization manipulated optical signal having one of at least two distinguishable polarization
22 states including a third polarization state and a fourth polarization state, wherein said first and
23 second polarization manipulation means include portions formed as part of the same substrate of
24 a liquid crystal device utilizing different electrode pairs;

25 a second optical separation means for spatially separating a second selected
26 optical signal from said series of optical signals when the polarization state of the second
27 polarization manipulated optical signal is in a third polarization state, thereby forming a forth
28 and fifth output optical signal, and maintaining the spatial alignment of said second selected
29 optical signal with said series of optical signals when the polarization manipulated optical signal
30 is in a fourth polarization state so as to form a sixth optical output.

1 17. (Presently amended) A device for filtering a series of predetermined
2 selected optical signals having predetermined wavelength ranges from a series of optical signals,
3 the device comprising:

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4 a polarization alignment means for substantially aligning substantially orthogonal
5 polarization states of an optical input signal so as to produce a polarization aligned optical signal;

6 a first polarization manipulation means for independently imparting a first
7 controlled polarization manipulation to said polarization aligned optical signal so as to output a
8 first polarization manipulated optical signal having one of at least two distinguishable
9 polarization states including a first polarization state and a second polarization state;

10 a first optical separation means for spatially separating a first selected optical
11 signal from said series of optical signals when the polarization state of the polarization
12 manipulated optical manipulated signal is in a first polarization state, thereby forming a first and
13 second output optical signal, and maintaining the spatial alignment of said first selected optical
14 signal with said series of optical signals when the polarization manipulated optical signal is in a
15 second polarization state so as to form a third optical output;

16 a first reflection element, reflecting said first and third optical signal after they
17 have passed through said first polarization manipulation means; said reflection element reflecting
18 the first and third optical signals towards a second polarization manipulation means;

19 a second polarization manipulation means for independently imparting a second
20 controlled polarization manipulation to said first and third optical signals so as to output a second
21 polarization manipulated optical signal having one of at least two distinguishable polarization
22 states including a third polarization state and a fourth polarization state;

23 a second optical separation means for spatially separating a second selected
24 optical signal from said series of optical signals when the polarization state of the second
25 polarization manipulated optical signal is in a third polarization state, thereby forming a forth
26 and fifth output optical signal, and maintaining the spatial alignment of said second selected
27 optical signal with said series of optical signals when the polarization manipulated optical signal
28 is in a fourth polarization state so as to form a sixth optical output; wherein said first and second
29 optical separation means include portions formed as part of the same substrate of a liquid crystal
30 Fabry-Perot etalon device utilizing different electrode pairs.

Claims 18 –21 (Canceled).

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1 22. (Presently amended) A device as claimed in claim 1 wherein said ~~optical~~
2 ~~separation means includes a~~ liquid crystal Fabry-Perot etalon filter ~~which~~ further comprises:
3 a first and second partially reflective substrate; a liquid crystal material interposed
4 between the partially reflective substrates;
5 an electric field generation means generating an electric field over the liquid
6 crystal material; wherein the reflectivity of one of the substrates is altered to differ from the other
7 and the electric field is manipulated so as to increase the transmission characteristics of the filter
8 at a predetermined frequency.

1 23. (Presently amended) A device as claimed in claim 1 wherein said ~~optical~~
2 ~~separation means includes a~~ liquid crystal Fabry-Perot etalon filter ~~which~~ further comprises:
3 a first and second substrate;
4 a liquid crystal material interposed between the reflective substrates;
5 at least one transparent electrode affixed to the surface of at least the first
6 substrate; and wherein said first substrate includes a transparent material having a thermal
7 conductivity substantially greater than glass.

1 24. (Original) A device as claimed in claim 23 wherein the substrate is formed
2 from sapphire or crystalline quartz.

1 25. (Presently amended) A device as claimed in claim 1 wherein said liquid
2 crystal Fabry-Perot etalon filter device includes:
3 ~~at least one liquid crystal device having~~ a liquid material suspended between a
4 first and second substrate, with at least one substrate containing an electrode, said material
5 altering first physical properties in accordance with an applied electric field; and
6 high frequency alternating current application means for applying a high
7 frequency alternating current to said at least one electrode, thereby heating the electrode and
8 consequently heating the liquid material, said frequency being such that the first physical

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9 properties of said liquid material are substantially unaffected by said high frequency alternating
10 current.

Claims 26-31 (Canceled).